

ABSTRACT OF THE DISCLOSURE

A display apparatus includes a spatial light modulator, such as a digital micromirror device or an LCD panel, and a lighting unit that illuminates the spatial light modulator.

- 5 The lighting unit may include red, green, and blue lamps which emit light that impinges on a DMD from at least two different directions. The lamps may be flash tubes which are fired at different binary levels in accordance with the rank of the bits that are being displayed on the DMD. The lamps may be fluorescent lamps which are driven steadily at predetermined levels while the rows of micromirrors are turned on in sequence and
- 10 subsequently turned off in sequence. Resetting to dislodge micromirrors that have become stuck can be accomplished by emitting current pulses through the micromirrors while exposing them to a magnetic field. The illumination unit may include a lamp unit and a color wheel. The light from the lamp unit can be integrated, and the data displayed on the spatial light modulator can be changed when the integrated light reaches a predetermined
- 15 value. The color wheel may be rotated faster than the frame repetition rate of video information that is being displayed. The intensity of the light may be controlled in accordance with the bit rank or significance of the bits that are being displayed by the spatial light modulator. Several techniques for achieving different intensity levels are disclosed.